

REMARKS

The Office Action dated January 24, 2005 has been received and carefully considered. The above amendments and the following remarks are being submitted as a full and complete response to the Office Action.

Independent claims 1, 6, 7, 12, 13, 18, 19 and 20 have been amended to merge the features of the moving step with the step directed to remapping the texture images. The essential features of the former moving step still remain in each of the claims. However, considering the program upon which the present disclosure is based, the remapping step actually results in the movement of the texture images. That is, movement and remapping of the texture images need not necessarily take place in two separate steps. Accordingly, this amendment more succinctly and accurately sets forth the features of the present invention.

In addition, to even more specifically define over the cited prior art of record, the feature recited in former dependent claims 58 through 63, directed to the circulating fashion in which the texture images are moved among respective adjacent polygons making up the object, has been added to each of the remaining independent claims.

To reduce issues, claims 21 to 66 have been deleted. Finally, new dependent claims 67 to 82 have been added, to set forth additional features of the remapping step, as well as to claim that the object, which is made up from the plurality of polygons, may comprise a three-dimensional object.

It is once again respectfully submitted and emphasized that Ebersole et al., the primary reference relied on in the Office Action, does not suggest any technique of mapping and then remapping a plurality of different texture images, as claimed, wherein, during remapping, the texture images associated with respective polygons making up an object are moved, so as to become associated with different polygons within the same object.

More specifically, as noted in the applicant's previous response of September 17, 2004, and as shown and discussed in the present specification in relation to FIG. 3, an object 204 is made up of a plurality of respective semitransparent or transparent polygons 206, with respective texture images 208 (e.g., see FIGS. 4A and 4B) being initially mapped onto each of the polygons. Then, the texture images are remapped, during which the texture images are moved in a circulatory fashion, as shown in FIG. 3, to become associated with different adjacent polygons. For example, when remapped, the texture images in group ① are moved, as shown by the left pointing arrows, so that the texture image (5) is shifted to occupy the polygon formerly occupied by texture image (4), the texture image (4) is shifted to occupy the polygon formerly occupied by texture image (3), and the texture image (1) is shifted to occupy the polygon formerly occupied by texture image (5), and so forth, in a circulating manner. Thus, when the textures are remapped, each respective texture is moved and ends up being associated with a different adjacent polygon from where it had been previously mapped.

Claims 1, 5-7, 11-13 and 17-63 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ebersole et al. (U.S. Patent No. 6,500,008).

Turning first to the Examiner's rebuttal arguments stated on pages 9 to 10 of the Office Action, the Examiner argues that Ebersole discloses "mapping respective texture images onto a plurality of polygons" and "moving texture images within different polygons."

However, in making this assertion, the Examiner refers to isolated parts from two different rendering techniques disclosed in Ebersole (one for representing smoke, and the other for representing flow of an extinguishing agent). These two different rendering techniques are not disclosed as being implemented together for rendering the same multi-polygonal object, and therefore it is incorrect for the Examiner to combine these isolated parts of the reference as though they defined a comprehensive object-rendering technique.

More specifically, in relation to the real-time depiction of fire, as diagramed in FIGS. 2A to 2C, and in particular for representing smoke therein, as shown in FIG. 2A, the Examiner points out that Ebersole discloses that "a texture map 11 representing a puff of smoke is applied to each particle 10." (See, col. 7, lines 19-20.)

Secondly, in relation to the graphic representation of the extinguishing agent (water stream) flow, as diagramed in FIGS. 4A to 4B, the Examiner points out that Ebersole discloses and claims, "moving said texture map in the direction of extinguishing agent

flow to simulate extinguishing agent flow." (See, col. 18, lines 19-20, and col. 8, line 66, through col. 9, line 23.)

It is respectfully submitted that the rebuttal arguments are flawed, because the Examiner is picking and choosing individual features from two different graphical representations, one of which represents fire/smoke (FIGS. 3A to 3C) and the other of which represents an extinguishing agent flow (FIGS. 4A to 4B) applied to the fire. Although these depictions may be displayed together interactively, the basic rendering techniques and systems used for representing smoke, on the one hand, and the extinguishing agent on the other, are quite different and basically independent from each other. Ebersole et al. does not disclose an object rendering technique having both features, in which respective texture images are mapped to each of a plurality of polygons making up the object, and in which the texture images are moved and remapped onto different polygons within the same object, as currently claimed.

It is true that, in the depiction of smoke, a texture map 11 representing a puff of smoke is applied to each of a plurality of particles 10, each particle consisting of two triangular polygons, as shown in FIG. 2A of Ebersole et al. However, in this rendering technique, there is no movement of the texture map 11 with respect to the polygons (i.e., triangles) making up each particle 10. There is certainly no suggestion of any technique of mapping, and then remapping a plurality of different texture images, as claimed, wherein the texture images associated with

respective polygons making up an object are moved, so as to become associated with different polygons within the same object.

By contrast, in the depiction of the extinguishing agent shown in FIGS. 4A and 4B of Ebersole et al., as was explained with considerable care in the applicant's previous response, a wireframe mesh surface 24 is texture mapped using a single water texture. The texture map, which is mapped onto the wireframe mesh surface 24 shown in FIG. 4B, does not comprise a plurality of different textures respectively mapped onto a plurality of polygons making up an object, as currently claimed. That is, Ebersole et al. describes the surface 24 as a "wireframe mesh 24" (col. 9, line 16), and therefore it is clear that the surface indicated by reference numeral 24 refers to the wireframe mesh as a whole. In other words, although the wireframe mesh 24 is constructed from a plurality of triangles, there is no suggestion in Ebersole et al. that the plurality of triangles making up the wireframe mesh 24 each have respective texture images mapped thereto. Rather the cited reference states that the "wireframe mesh 24 in FIG. 4B" (i.e., the surface 24 of the wireframe mesh as a whole) "is texture mapped with a water texture, and the texture map is translated in the direction of flow at the speed of flow" (emphasis supplied). Therefore, the only movement provided in this rendering method is movement (i.e., translation) of the single water texture image over the wireframe mesh surface 24.

Therefore, the applicant respectfully submits that in either of the graphical depictions, for representing smoke (FIG.

2A) or water flow (FIG. 4B), there is no disclosure of mapping a plurality of respective texture images onto polygons making up an object, and then remapping the plurality of texture images to thus move and become associated with different polygons in the same object. On the contrary, in the particle system of FIG. 2A representing smoke, the texture images 11 of smoke puffs are fixed relative to the triangular polygons of each particle 10. The only movement of a texture image with respect to a multi-polygonal object occurs as the translation of the single water texture over the wireframe mesh 24 shown in FIG. 4B. These respective graphical rendering techniques clearly cannot amount to a sum greater than their parts.

Further, the Examiner has now admitted that Ebersole et al. does not disclose any rendering technique in which a plurality of textures are used in the same object. (See, page 3, last paragraph, of the Office Action.) While asserting that it would have been obvious to do so, the Examiner has produced no cited evidence to support his assertion. It is respectfully submitted that these facts alone render the rejection deficient.

Finally, as noted above, the features of dependent claims 58 through 63, directed to the circulating manner in which the texture images are moved among respective adjacent polygons making up the object, have been added to each of independent claims 1, 6, 7, 12, 13, 18, 19 and 20, respectively. Even if one were to accept, for the sake of argument, that some type of movement of texture images between polygons making up an object is taught in Ebersole et al., there is nothing in the cited

reference even remotely suggesting that respective texture images are moved to adjacent polygons in the same object, and that, during remapping, the texture images are moved in a circulating manner among such adjacent polygons, as described above. For this additional reason, the amended claims could not have been obvious over the cited prior art.

Accordingly, pending claims 1, 5-7, 11-13, 17-20 and 67-82 are in condition for allowance. Careful reconsideration and withdrawal of the rejections is respectfully requested.

Claims 64 to 66 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ebersole et al. in view of DiFrancesco (U.S. Patent No. 5,194,969).

Claims 64 to 66 have been canceled. Therefore, insofar as pertaining to the amended claims, the above rejection is considered to be moot.

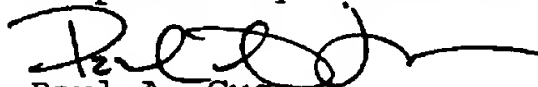
However, briefly, DiFrancesco clearly does not remedy or overcome the deficiencies of Ebersole et al. DiFrancesco was cited for disclosing two superimposed objects (250, 250') having textures therein, however, there is no disclosure in this reference, or in Ebersole et al., of remapping a plurality of respective texture images. Moreover, the additional limitation, directed to the circulating manner in which the texture images are moved among respective adjacent polygons of an object is not disclosed or suggested in DiFrancesco. There is nothing in the cited references, including DiFrancesco, even remotely suggesting that respective texture images are remapped onto adjacent polygons in the same object, such that the texture images are

moved in a circulating manner among such adjacent polygons, as described above.

For the foregoing reasons, it is respectfully submitted that the claimed invention would not have been obvious to a person skilled in the art at the time the present invention was made. Reconsideration and withdrawal of the rejections, with allowance of the amended claims, is respectfully requested.

The present response is accompanied by a request for a one-month extension of time for replying to the Office Action, the fee for which (\$120.00) may be charged to the Attorney's Deposit Account No. 07-2519. No other fees are due at this time. Notwithstanding, should it be deemed that fees, or deficiencies in fees, are required in connection with this or any accompanying communication, such amounts may be charged to the Attorney's Deposit Account.

Respectfully submitted,



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